9. *NAVARRETIA MYERSII* SSP. *DEMINUTA* (SMALL PINCUSHION NAVARRETIA)

a. Description and Taxonomy

Taxonomy.—Small pincushion navarretia was named only recently. The scientific name, *Navarretia myersii* ssp. *deminuta* (Day 1995), has not undergone any changes. The type locality for this subspecies is about 3 kilometers (2 miles) southeast of Middletown, in Lake County (Day 1995). *Navarretia myersii* ssp. *deminuta* is a member of the phlox family (Polemoniaceae).

Description and Identification.—Basic morphology of the genus was described under *Navarretia leucocephala* ssp. *pauciflora*. The overall appearance of *N. myersii* ssp. *deminuta* is that of a compact head of flowers growing directly out of the ground. *Navarretia myersii* ssp. *deminuta* (**Figure II-32**) has a very short stem that is thickened below ground level and bears one or two closely-spaced pairs of leaves above ground. The narrow, usually entire leaves are 1 to 5 centimeters (0.4 to 2.0 inches) long and extend far beyond the flower head, which is only 0.8 to 2 centimeters (0.3 to 0.8 inch) wide. Typically each plant has only a single flower head, although one or two secondary heads occur occasionally. Individual flowers are stalkless, with a short-hairy calyx 5 to 6 millimeters (0.20 to 0.24 inch) long and a blue corolla 12 to 13 millimeters (0.47 to 0.51 inch) long. The corolla tube is about the same length as the calyx, and the stamens and stigma protrude from the corolla tube. Inner bracts (those closest to the flowers) are about equal to the calyx in length; they have a broad, papery base and a few lobes near the tip. Three to five outer bracts, which are 1 to 2 centimeters (0.4 to 0.8 inch) long, occur on the periphery of the head. The outer bracts are broad and papery at the base, have toothed or forked lobes between the base and the middle, and are unbranched near the tip. The capsules contain four to six seeds each (Day 1995). The chromosome number of *N. myersii* ssp. *deminuta* is not known.

Navarretia myersii ssp. *myersii* (pincushion navarretia) is the closest relative of *N. myersii* ssp. *deminuta*. The former has a white flower, the corolla is longer (17 to 21 millimeters [0.67 to 0.83 inch]) than in *N. myersii* ssp. *deminuta*, the corolla tube is two to four times as long as the calyx, and the outer bracts are lobed only above the middle. Another similar species, *N. prostrata* (prostrate navarretia), has multiple (up to 20) flower heads per plant, shorter corollas (6 to 9 millimeters

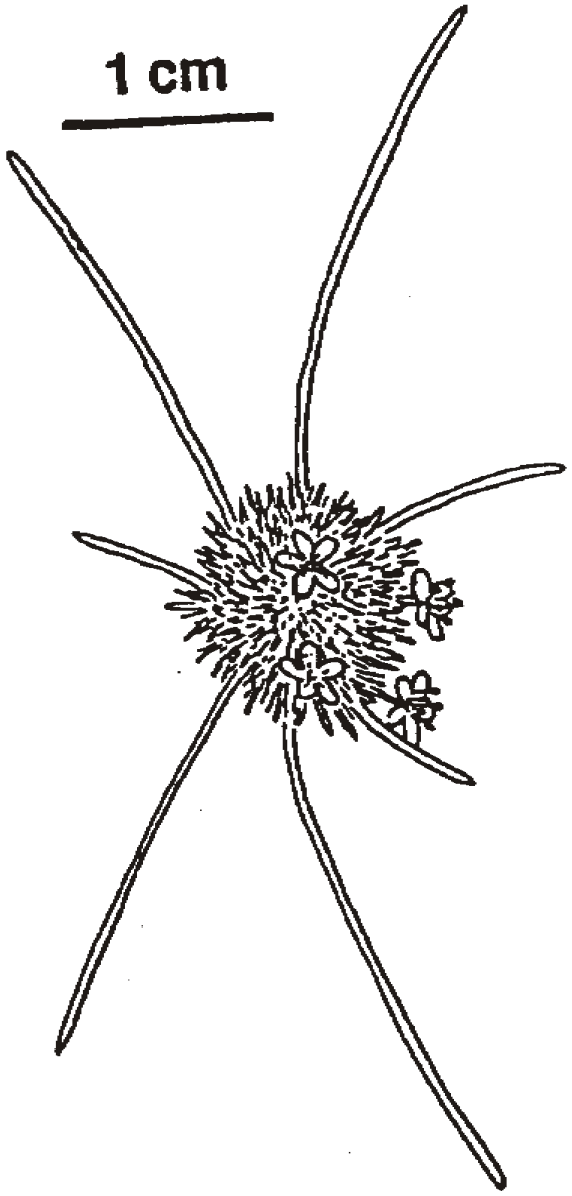

Figure II-32. Illustration of *Navarretia myersii* ssp. *deminuta* (small pincushion navarretia). (Reprinted with permission from the California Botanical Society)

[0.24 to 0.35 inch]), white or blue flowers, lobed leaves, outer bracts that are lobed throughout their length, and contains between 5 and 25 seeds per capsule (Day 1995). Other vernal pool navarretias, including *N. leucocephala* ssp. *pauciflora* and *N. leucocephala* ssp. *plieantha*, differ from *N. myersii* ssp. *deminuta* in that they have conspicuous branches and their corollas are comparatively short (Day 1993*b*).

b. Historical and Current Distribution

Historical Distribution.—*Navarretia myersii* ssp. *deminuta* was just discovered in 1992 and no earlier collections are known. Thus, the historical distribution is identical with the current distribution (**Figure II-5**).

Current Distribution.—*Navarretia myersii* ssp. *deminuta* is known only from the type locality in Lake County (Day 1995, A. Day pers. comm. 1997, L. Esposito pers. comm. 1997, California Natural Diversity Data Base 2005). Thus, the taxon is restricted to the Lake-Napa Vernal Pool Region (Keeler-Wolf *et al.* 1998).

c. Life History and Habitat

Reproduction and Demography.—The reproductive biology of *Navarretia myersii* ssp. *deminuta* has not been investigated but probably is similar to that of *N. leucocephala* ssp. *pauciflora* because they are closely-related vernal pool annuals (Day 1993*a*). *Navarretia myersii* ssp. *deminuta* flowers in April and May (Day 1995). The single population contained about 25,000 plants in 1992 (California Natural Diversity Data Base 2001). In 1993, following a season of above-average rainfall, *N. myersii* ssp. *deminuta* plants had longer leaves and more flowers than in the previous or the following years, which were drier (Day 1995).

Habitat and Community Associations.—At the single known site, *Navarretia myersii* ssp. *deminuta* occurs in vernal pools, at the edges of vernal swales, and in low areas adjacent to a road. The pools and other depressions occur within a matrix of annual grassland on clay loam soil (Day 1995, California Natural Diversity Data Base 2001). Specific types of vernal pools in which it occurs have not been reported. The type locality is at 331 meters (1,087 feet) in elevation (California Natural Diversity Data Base 2001). Plants associated with *N. myersii* ssp. *deminuta* at the site include *Eryngium aristulatum*, *Downingia concolor* (fringed downingia), *Juncus bufonius*, *Isoetes howelli* (Howell's quillwort), and *Psilocarphus brevissimus* (California Natural Diversity Data Base 2001).

d. Reasons for Decline and Threats to Survival

Most species addressed in this recovery plan are threatened by similar factors because they occupy the same vernal pool ecosystems. These general threats, faced by all the covered species, are discussed in greater detail in the Introduction section of this recovery plan. Additional, specific threats to *Navarretia myersii* ssp. *deminuta* are described below. *Navarretia myersii* ssp. *deminuta* is not known to have declined; the subspecies was unknown prior to 1992.

The single locality for *Navarretia myersii* ssp. *deminuta* was threatened by a subdivision (Day 1995, California Natural Diversity Data Base 2001), which was never developed. However, the parcel is zoned rural residential, and the landowner could build a residence, drain the wetland, or make other alterations without being required to obtain permits or conduct an environmental review (L. Esposito *in litt.* 2000). No imminent threats to the population have been noted but two more remote threats are possible. The single population makes *N. myersii* ssp. *deminuta* extremely susceptible to extinction by random events, including both natural and human-caused catastrophes.

e. Conservation Efforts

Navarretia myersii ssp. *deminuta* does not have any formal protection under Federal or State law. However, the California Native Plant Society (2001) considers *N. myersii* ssp. *deminuta* to be extremely rare and in danger of extinction, and thus has added it to List 1B. No conservation efforts have been reported other than denial of a development permit by Lake County officials (L. Esposito pers. comm. 1997).

10. *PLAGIOBOTHRYS HYSTRICULUS* (BEARDED POPCORN FLOWER)

a. Description and Taxonomy

Taxonomy.—Piper (1920) first recognized bearded popcorn flower as a unique entity, assigning the name *Allocarya hystricula*. Jepson had collected the type specimen in 1892 from the Montezuma Hills, Solano County (Piper 1920). In his monograph on *Plagiobothrys*, Johnston (1923) considered *Allocarya hystricula* to be the same as *Plagiobothrys greenei* (Greene's popcorn flower). After several revisions to the name by various individuals, Johnston (1932 as cited in Abrams 1951) assigned the name by which bearded popcorn flower is known today, *Plagiobothrys hystriculus*. This taxon is in the borage family (Boraginaceae). Another common name for bearded popcorn flower is bearded allocarya (Smith *et al.* 1980).